

# RELY

## REliable REinforcement Learning for sustainable energyY systems

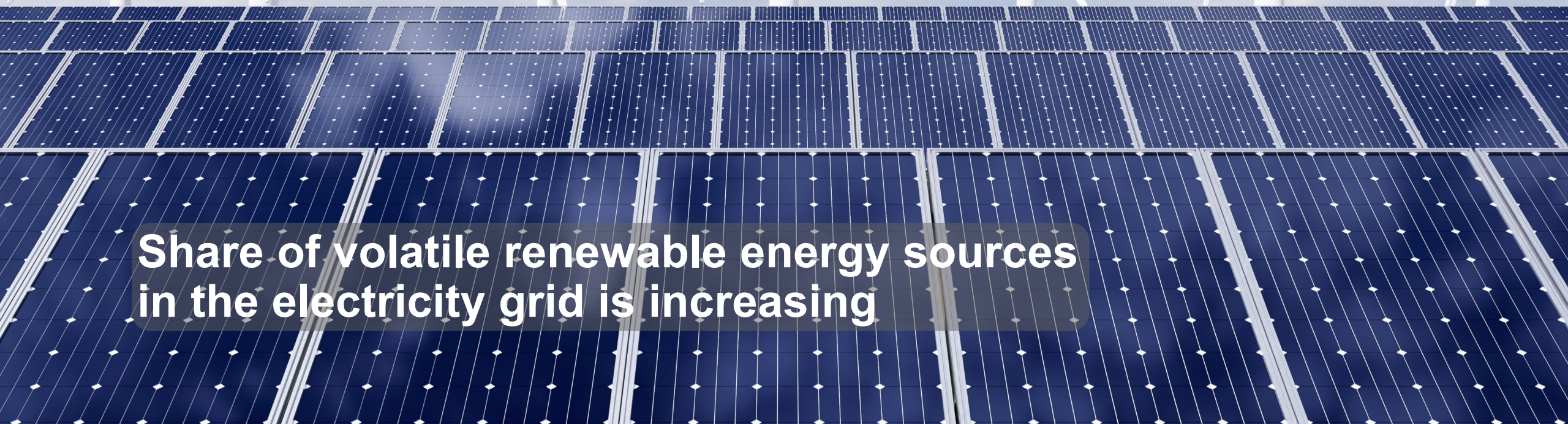
### Abstract

Due to the increasing complexity, the growing number of players in the energy market and the resulting need for increased flexibility, machine learning algorithms will play a significant role in decision making and coordination of load balancing in the energy system of the future. To enable the use of machine learning for critical infrastructure despite safety concerns, the goal of RELY is to develop and test a method in which the reliability, robustness, and safety of the artificial intelligence's actions increase highly. Within the project, a reinforcement learning algorithm is being pre-trained on a virtual representation and then transferred to the real system using a digital twin platform. This enables the learning algorithm to adapt its strategy to real conditions and thus optimally control the respective process. The method is tested and analyzed using a machine unit that represents the complexity and required fast response times of tomorrow's integrated grid: the reversible pump turbine.



### Ansprechperson

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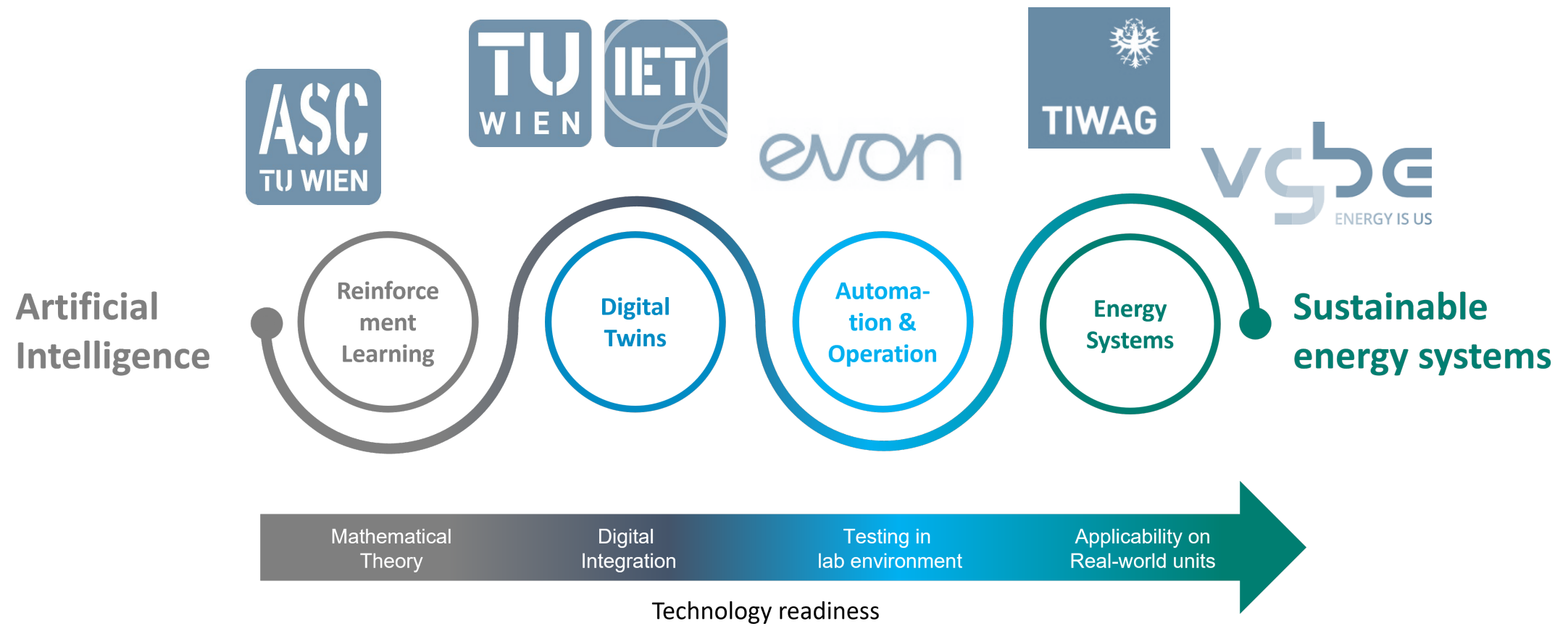
**Share of volatile renewable energy sources  
in the electricity grid is increasing**

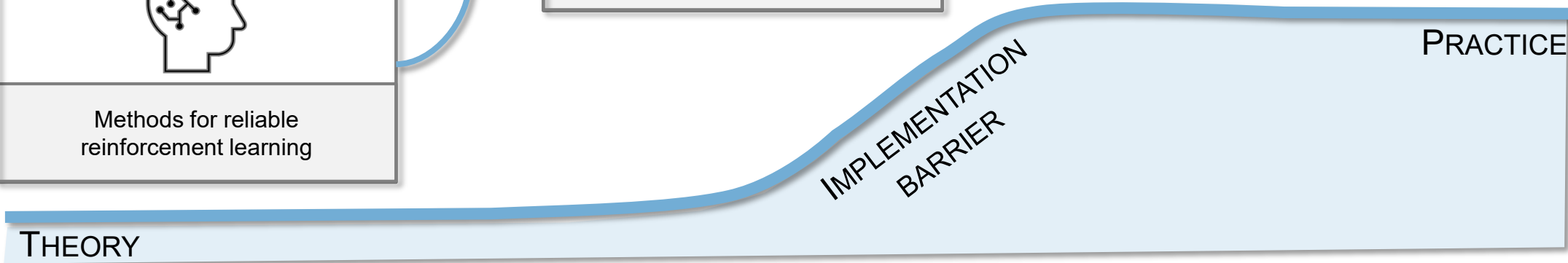
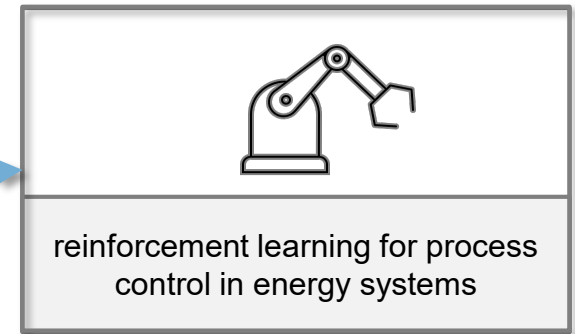
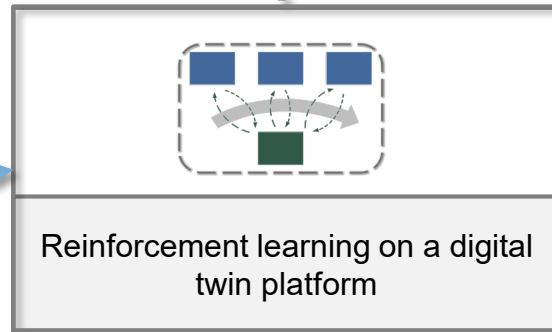
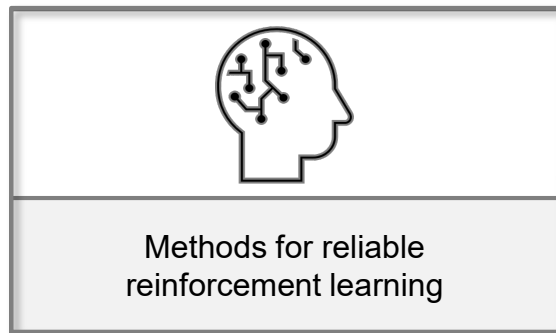
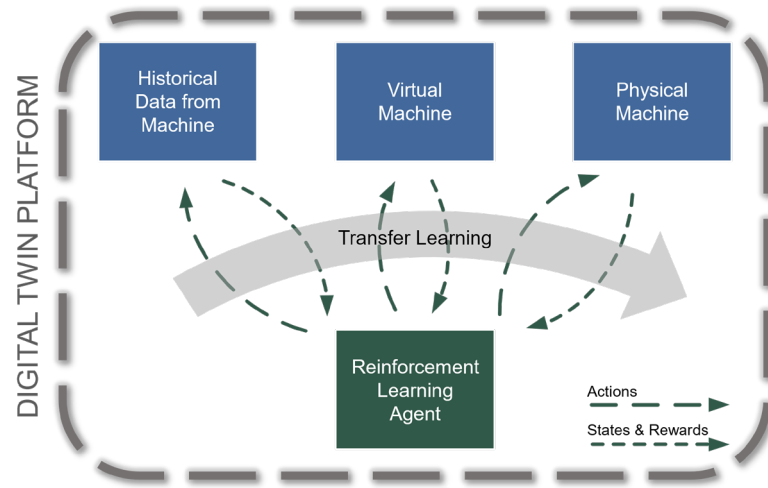
IMAGE BY VANITJAN ON FREEPIK

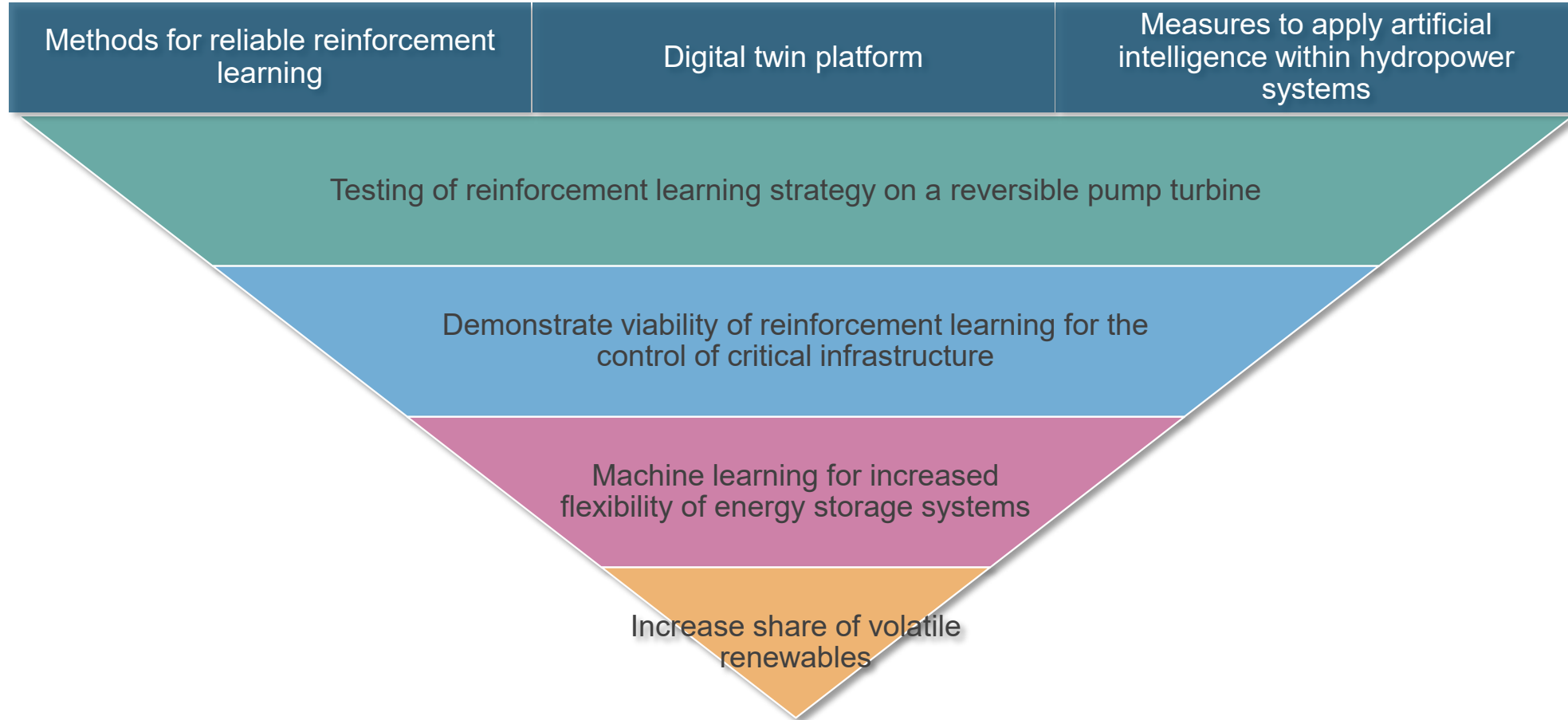




**Increased flexibility is required for guaranteeing grid stability**







**CLIMATE NEUTRALITY**





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